

WHAT IS CLAIMED IS

1. An on-board antenna comprising:

a grounding conductor provided on a surface of a first dielectric substrate; and

an antenna element including:

a first radiation element provided on the surface of the first dielectric substrate; and

a second radiation element provided on the first radiation element so as to protrude from a surface of the first dielectric substrate and extend in a vertical direction.

2. An on-board antenna as set forth in Claim 1, the antenna element further including:

a pair of third radiation element disposed on an end portion of the second radiation element in a direction that the second radiation element extends, the pair of third radiation element branching in horizontal and different directions from each other so that the second and third radiation elements of the antenna element form a T-shape.

3. An on-board antenna as set forth in Claim 1, wherein the grounding conductor has a notched portion in an outer edge portion thereof.

4. An on-board antenna as set forth in Claim 2, wherein the grounding conductor has a notched portion in an outer edge portion thereof.

5. An on-board antenna as set forth in Claim 1, wherein the second radiation element of the antenna element is an I-shape.

6. An on-board antenna as set forth in Claim 1, further comprising:

a second dielectric substrate disposed on the first dielectric substrate so as to be substantially perpendicular thereto

wherein the second radiation element is disposed on the second dielectric substrate.

7. An on-board antenna as set forth in Claim 2, further comprising:

a second dielectric substrate disposed on the first dielectric substrate so as to be substantially perpendicular thereto

wherein the second and the third radiation elements are disposed on the second dielectric substrate.

8. An on-board antenna as set forth in Claim 1, wherein the radiation element is a semiconductor.